

Science and Technology Committee: inquiry for Brexit summit

Introduction

1. This is the official response from the Royal Astronomical Society (RAS) to the inquiry by the House of Commons Science and Technology Committee in preparation for the Brexit summit on 22 February 2018.
2. The RAS represents 4,000 astronomers and geophysicists, predominantly in the UK, in occupations in academia, industry, education and public engagement, and journalism, as well as others in the wider economy. Our members are described as 'Fellows'.
3. Many of our Fellows are beneficiaries of grants and related funding from European Union sources. A significant proportion of our membership (around 9% according to our most recent survey) also originates from other EU countries. The Society and its staff are though not in receipt of any EU funding at the time of writing.
4. In considering this response, we refer committee members to previous evidence from the Society relating to this area, for example to the Science and Technology Select Committee inquiry: "Leaving the EU: implications and opportunities for science and research"¹ (2016) and the House of Lords Science and Technology Committee inquiry: "Relationship between EU membership and the effectiveness of UK science"² (2015).
5. Many of the arguments set out in those responses remain in place, not least because of the continuing uncertainty around the future relationship between the UK and the European Union.
6. This document builds on our earlier submissions, and reflects additional data, policy announcements by the UK government and new examples supplied by our Fellows.
7. An important context is the existing strength of astronomy, space science and geophysics in the UK and its wider relevance. These research communities have grown, and their output remains world-leading. International citation indices demonstrate this productivity and, on this metric, the UK currently ranks second in the world in geophysics³, and space and planetary science⁴, and third in the world in astronomy⁵.

¹ <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee/leaving-the-eu-implications-and-opportunities-for-science-and-research/written/35564.pdf>

² <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/science-and-technology-committee-lords/relationship-between-eu-membership-and-the-effectiveness-of-uk-science/written/24730.pdf>

³ <http://www.scimagojr.com/countryrank.php?area=1900&year=2016&order=ci&ord=desc&category=1908>

⁴ <http://www.scimagojr.com/countryrank.php?area=1900&year=2016&order=ci&ord=desc&category=1912>

⁵ <http://www.scimagojr.com/countryrank.php?area=3100&year=2016&order=ci&ord=desc&category=3103>

8. These sciences have a significant impact in wider society. Examples of spin-out businesses, technology transfer and utilisation of research skills in other occupations appear in a series of booklets published by the RAS⁶. Astronomy and space science in particular are also well-established 'STEM attractors', helping to recruit students into science subjects in general.⁷

Specific points raised by the Committee

Collaboration on science and innovation: a future partnership paper

9. This statement of intent published by the UK government in September 2017 was welcome. It recognises the strength of the UK research base, acknowledges issues such as the lack of access 'third countries' have to funding from EU framework programmes and to involvement in research infrastructures, and sets out a goal of a deep and comprehensive agreement on science between the UK and EU27 countries.
10. The Society notes though that the document makes no mention of a future UK financial contribution to EU programmes beyond 2020, and that the rhetoric on recruiting the 'brightest and best' to the UK may discourage all but the most confident of early career researchers from considering a move here. The nature of any agreement between the UK and EU27 is also clearly of paramount importance, not least in giving some certainty to the scientific community. For example, anything less than 'associate country' status for future framework programmes seems unlikely to yield the level of scientific collaboration currently in place between UK researchers and their European counterparts.

The joint EU / UK agreement on an 'Orderly UK withdrawal' from the EU

11. The initial agreement has welcome provision for EU27 nationals resident in the UK, for UK nationals resident in other EU countries, and their immediate families. The Society though notes that there is currently no mention of transfer of pension provision, or more generally mobility after Brexit, two areas of concern for the astronomy and geophysics and wider STEM communities.
12. To put this in context, our most recent (2016) demographic survey on research astronomers and geophysicists included questions on nationality. The survey confirmed that EU27 nationals are a core part of the workforce for these sciences: 19% of permanent staff in these areas in universities and research establishments, 33% of postdoctoral research associates and 16% of postgraduate students.⁸

⁶ <http://www.ras.org.uk/publications/other-publications>

⁷ <https://academic.oup.com/astrogeo/article/52/3/3.32/187384> (and UCAS data to 2014)

⁸ http://www.ras.org.uk/images/stories/DemographicSurvey/2017/demographic_survey_full.pdf

13. Committee members should also note the negative impact of the 2016 referendum and its aftermath on the morale, recruitment and retention of researchers. The Society has reports from research groups around the UK of researchers declining the renewal of contracts, and of UK employees relocating to other EU countries. It now appears that every applicant for a postgraduate studentship or a postdoctoral role asks about the impact of Brexit, and European nationals are far less likely to apply.
14. Our concern is that it will take time to obtain quantitative data in support of this anecdotal evidence, and that the damage to research groups is already taking place. Scientists employed in curiosity-driven research such as astronomy, and a significant proportion of geophysics, need urgent assurances on continued funding for their work, and that their ability to move between posts in the UK and the EU will not be compromised.

UK participation in Horizon 2020 and future EU Framework Programmes

15. The Society welcomes the commitment in principle by the UK to continue financial contributions to Horizon 2020, and the agreement in principle between the EU27 and the UK to allow British participation in that programme until it comes to an end. This gave some much needed assurances to astronomy and geophysics research groups, who have been major beneficiaries of the Framework Programmes since their inception.
16. We note though that this is contingent on a wider agreement on the departure of the UK from the EU. The European Commission indicates that should the UK withdraw without such an agreement being in place and ensuring participation in Horizon 2020, research groups here will lose eligibility for funding and could be required to leave projects already underway.
17. Beyond 2020, there is overwhelming support from the astronomy and geophysics communities for continued UK participation in EU Framework Programmes. This is hardly surprising, as UK research groups have been major beneficiaries of these schemes. Taking the example of the European Research Council (ERC), from 2007-16 staff in universities and research groups here were awarded more than €117 million (£102 million) for astronomy and €127 million (£110 million) for geophysics-related projects. ERC grants are particularly effective in supporting curiosity-driven research, and researchers comment that the ethos of the scheme is centred on excellence, rather than other strategic considerations which overlay purely scientific merit.
18. In astronomy and space science, EU funding made up at least 30% of grant income for resources in 2016. This masks significant variation, with some research groups reporting that as much as 70% of their grant funding originates from EU sources. Groups also access EU infrastructures and schemes like the Marie Skłodowska-Curie actions - Research Fellowship Programme. Examples of research infrastructures include Europlanet, Radionet, OPTICON, SOLARNET, FLARECAST and APPEC. These foster collaboration and a pooling of research effort including sharing physical facilities.

19. One argument put forward is that the UK Government could simply replace EU funding for science with an identical budget. This though would not recognise the softer benefits of the Framework Programmes, such as the ability to participate in joint proposals with European colleagues as equal members of a consortium; access to the best possible talent from a considerably larger pool than in the UK alone; eligibility for Europe-wide training networks; and a completely level playing field in terms of proposing, participating in, and receiving benefit (both scientific and industrial) from major international research projects. Working with European colleagues on proposals, peer review and project assessment are also all activities which can generate new ideas and opportunities for the scientists involved.
20. This deep partnership, collaboration and sharing of resources is an enormous benefit for UK astronomy, space science and geophysics, and a major factor in its global success. The Society thus believes that full membership of the European Research Area, and full access to the Framework Programmes, is essential for these sciences to continue to thrive.

The Joint UK-China Strategy for Science and UK-US Science and Technology Agreement

21. UK astronomers and geophysicists have an exceptionally international outlook, and as a cohort welcome partnerships and collaboration between different nations. The Society therefore supports the overall aims of the UK-China and UK-US agreements.
22. We note that the UK-China agreement describes a project-based approach, with sharing of resources and academic exchange, and mutual access to research infrastructure. The specific inclusion of astronomy is welcome too.
23. The UK-US agreement similarly stipulates cooperation, acknowledging issues such as diversity in STEM occupations, and the need for straightforward movement of people associated with joint projects.
24. The Committee asks whether these agreements provide a future model for collaboration between the UK and the EU after Brexit. Aspects of them do that, for example in recognising the sharing of resources and the need for people to move with ease to engage in scientific research.
25. One major difference is the essentially top-down approach to funding projects under the agreement, with projects agreed through treaties. This is in contrast to the pooled resources of the EU Framework Programmes, which are open to bids from researchers in the different nations and assessed on the basis of scientific excellence without political interference. Many of the research programmes and infrastructures in place across Europe might not have been created without this system for harnessing the imagination of scientists.